driven alternator unit has been one of the most important factors in the growth of the electrical manufacturing and supply industries, and has made possible the evolution of modern steam-operated super-power stations.

Considerable progress has also been made in the development of turbine-driven blowers and compressors, most of the largest modern blower installations for steelworks and compressor plants for the coal- and gold-mining industries consisting entirely of turbine-driven units. On the other hand, the steam turbine has not yet succeeded in ousting the reciprocating engine in the large field of small-size blowers and compressors, owing mainly to the difficulty in constructing efficient small-power blowers and compressors of the high-speed rotary type.

CHAPTER V

The Parsons Type Turbine

The first practical steam turbine, the result of years of experiment and work, was built by Sir C. A. Parsons in 1884.

Fig. ii is a section through a Parsons type compound reaction turbine, and shows features of the most up-to-date practice.

In the largest size turbines the necessity for the passage of large volumes of steam at the exhaust end has led to the splitting of the steam flow, allowing a double flow in opposite directions.

Two main diameters in the high-pressure portion and two in each of the low-pressure portions are made on the rotor. This follows the present-day practice of four main diameters in all.

Referring to fig. 11, steam enters at port i and flows through the turbine to the exhaust end 35. Immediately after the first expansion is the overload by-pass inlet belt 24.

The dummy pistons for balancing the rotor are shown at 19, 20, and 21, and the equalizing pipes for equalizing the dummy pressure and that on the corresponding portion of the rotor are shown dotted, 23 and 37.

The rotor body is forged in one piece. The top half casing fits over long upright standards in the lower half, so that it can readily and easily be removed

and replaced. All high-pressure machines are fitted with an automatic atmospheric relief valve, so that should the vacuum fail at any time the turbine will exhaust to atmosphere.

The oil-tank will be seen together with the oil-pump, which supplies oil under pressure to all bearings.

Between the steam space and the bearings are placed the oil baffles and then the carbon segment glands—these are shown at 16, 30 and 17, 29.

The glands are steam packed, and 18, 28 show the vapour pipes from these glands.